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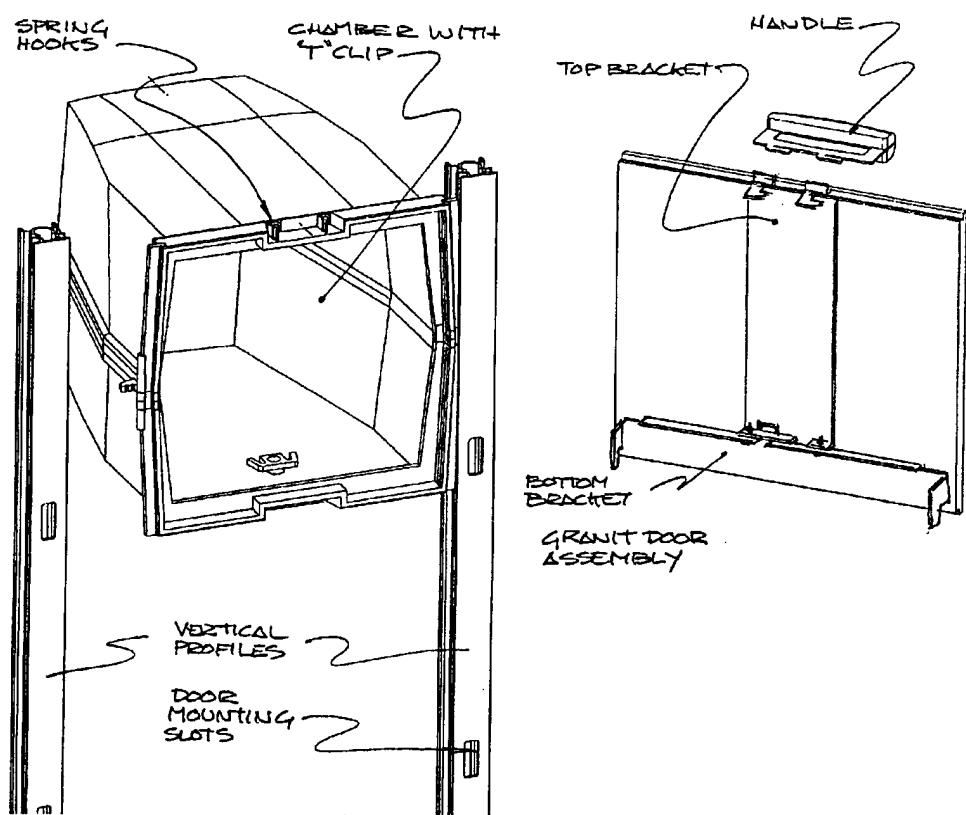
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(54) **MECANISME DE VERROUILLAGE POUR COLUMBARIUM**

(54) **A LOCKING MECHANISM FOR A COLUMBARIUM**



1. Field of the invention

A columbarium is a construction that is used to provide protection to a series of cremation urns that contain ashes of deceased people. These urns are installed in little chambers and each has an access door mounted on the structure of the columbarium. Columbarium can be constructed to be inside a building or outside.

The number of chambers varies depending on the configuration of the columbarium. Generally, the design of outdoor columbarium allows for various shapes. Typically these can be rectangular, with access through the front, side and/or back walls, circular, with access facing the exterior of the circle, and a variety of other shapes depending on the modularity of the assemblies.

A columbarium is conventionally composed of the following elements. A ground plate generally made of concrete or granite supports sidewalls that are generally made of granite or marble. These walls could also be made of other hard material (like plastics or metals) and support a top plate, or ceiling, that is also made of similar hard materials or by moulding techniques with materials like plastics or cement. Each chamber can be made in a variety of ways. Generally, they are made of slabs of various materials in a shelf manner to create individual compartments. The doors are generally made of flat slabs of granite or marble (but could also be made of other hard materials like plastics and metals) and are attached to either the columbarium's structure or to the chambers.

The present invention relates to two mechanisms. One that locks the urn inside the chamber while the other mechanism secures the door to the columbarium assembly and allows for the removal of the door by using a specially designed mechanical key.

2. Description of the related art

Part A The locking mechanism of the door.

There is a need to lock the doors that give access to the chambers to prevent theft or vandalism. Generally the doors are screwed with tamper resistant hardware to the structure of the columbarium. There is a need on the market for a system that locks the door without the use of screws for esthetical purposes, security purposes and for mechanical purposes. Screw holes can, with time, create cracks in the granite or marble.

When made of granite or marble, the doors weight more than 20 lbs each. That weight makes it difficult to hold the door as it is being removed. A feature that can help the user to pull the door open and retain part of the weight momentarily is also needed.

Part B Th securing of urns in the chambers.

Traditionally, when urns are installed inside the chambers of a columbarium, they are secured in place by gluing them on the floor of the chamber or are simply resting on the floor of the chamber, without any other fastening method. The use of screws and hardware for fastening the urns can create an appearance that is rough. There is a need to find a secure method of assembly that is also visually pleasing and that requires no tools. The security aspect of the assembly is also an issue for the family of the deceased.

3. Summary of the invention

Part A The locking mechanism of the door.

In this particular invention the chambers are made of individual boxes, called niches, that are stacked one on top of the other. The boxes are prevented from moving sideways by having a detail that is inserted in a vertical profile. So for two columns of stacked chambers there is a profile in between the columns. The profile is also used to transfer the weight of the doors to the footplate. There are also small grooves made along the profiles to locate the assembly mechanism of the doors.

The doors are made of hard materials, generally granite or marble, but could also be made of other materials like plastics and metals. The weight of the door needs to be transferred to the profile. The inside top and bottom edges of the door are shaped in an inverted chamfer manner. That creates a form similar to a groove. Two brackets, made of sheet metal, or other materials, are clamped together on the inside of the door and are held to the door using these grooves.

The lower bracket is slightly less wide than the width of the door. Its bottom edge is bent towards the exterior of the columbarium in an angled manner compatible with the groove at the bottom of the door. The two vertical ends of this bracket are bent towards the interior of the columbarium and are shaped in a hook manner that is compatible with the slots that are made in the profiles. The top edge of this bracket is bent towards the inside of the columbarium and has a detail that allows the assembly with the top bracket. This detail prevents lateral and forward/backward movements between the two brackets. The bottom edge of the top bracket is similar to the top edge of the lower bracket but is a mirror image so as to create a compatible mating system. The two brackets are assembled together by a means that allows a certain force, as in screws and bolts.

The top bracket is generally longer than its width. The top edge is bent towards the exterior of the columbarium in an angled manner compatible with the groove at the top of the door. Also from that top end, two hook shaped tabs are bent towards the interior of the columbarium. Finally, also from that top edge, two tabs go upward and are aligned with the two hooks so to protect them from access from the exterior of the columbarium.

There is a gap between the two brackets to absorb the tolerance due to the manufacturing process used to make the door. By tightening the screws, or similar tightening method, the two brackets are brought together and clamp themselves firmly to the door.

The boxes that create the chambers have two hooks that protrude towards the exterior of the columbarium. These hooks are mounted on the top surface of the box. They are made of flat material such as spring steel and are flexible. The hook shape of these parts is compatible in geometry and direction with the hooks that are on the bracket mounted on the door so as to snap together.

To install the door, the user needs to hold the door at an angle that allows for the insertion of the lateral hooks of the bottom bracket of the door in the slots of the vertical profiles. These hooks act as hinges and the door can be rotated upward to the close position where the hooks of the top bracket of the door will snap with the spring hooks mounted on the box.

To remove the door, the user needs to have a specially designed tool. This tool is made of flat material, like sheet metal, and is provided with a handle to help manipulate the system. The tool is formed in two horizontal parallel "L" shapes that are spaced apart by a distance compatible with the distance between the hooks of the door. The tool is inserted in the space between two doors, which is minimal, and around the two vertical tabs of the top bracket of the door. The tool is then moved sideways to exert a pressure on the spring hooks mounted on the chamber box. When the spring hooks are moved sideways, they release their grip on the hooks of the door, thus liberating the door. The user can then pull on the handle to release the door and tilt it towards the exterior of the columbarium. He can then use his hands to grasp the door and lift it in such a way that the hooks of the bottom bracket are liberated from the grooves of the profiles.

The same system can be adapted to create double doors (or a greater multiple), either in width or in height or both. It can also be used for indoor or outdoor columbarium.

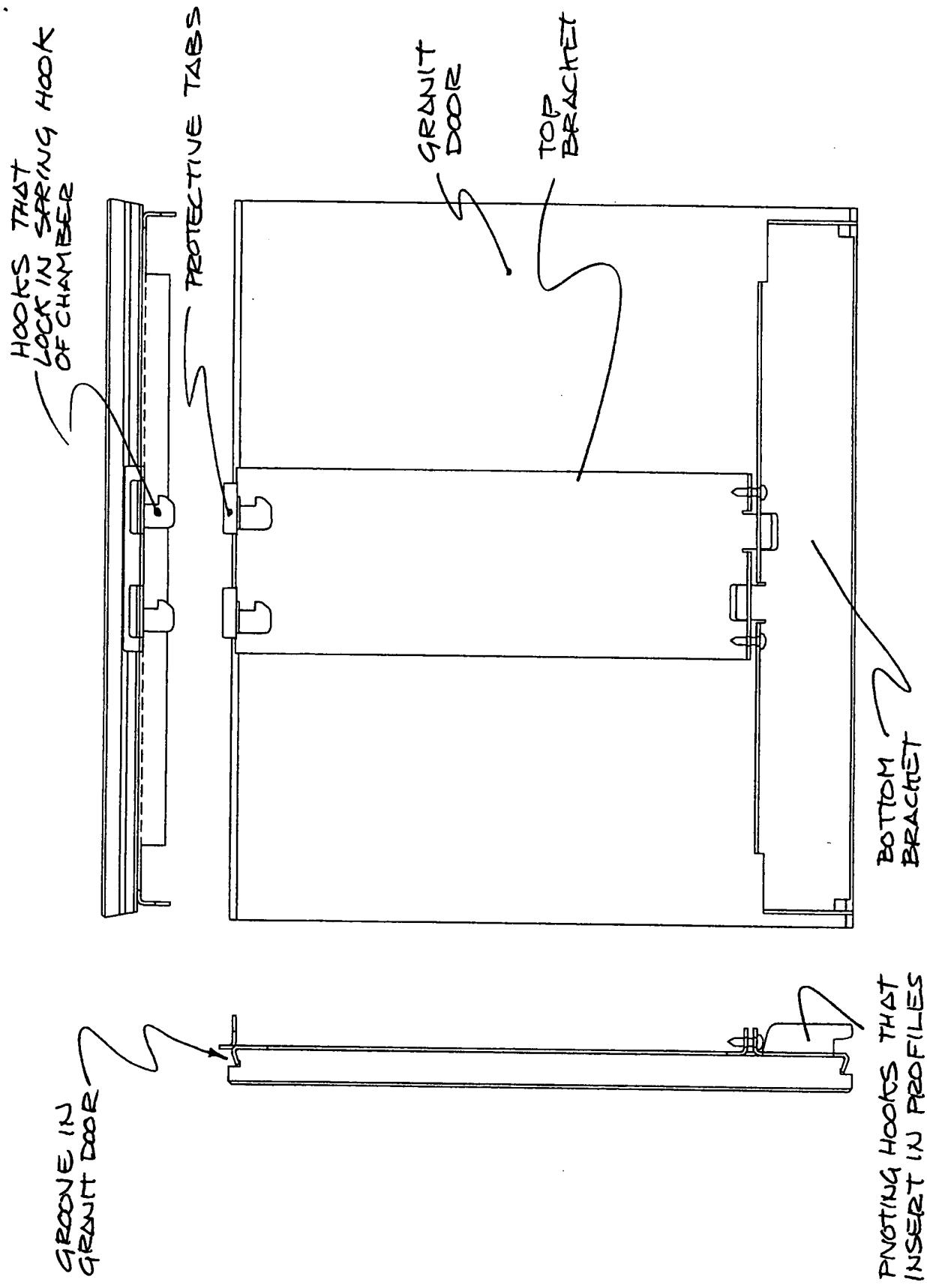
Part B The securing of urns in the chambers

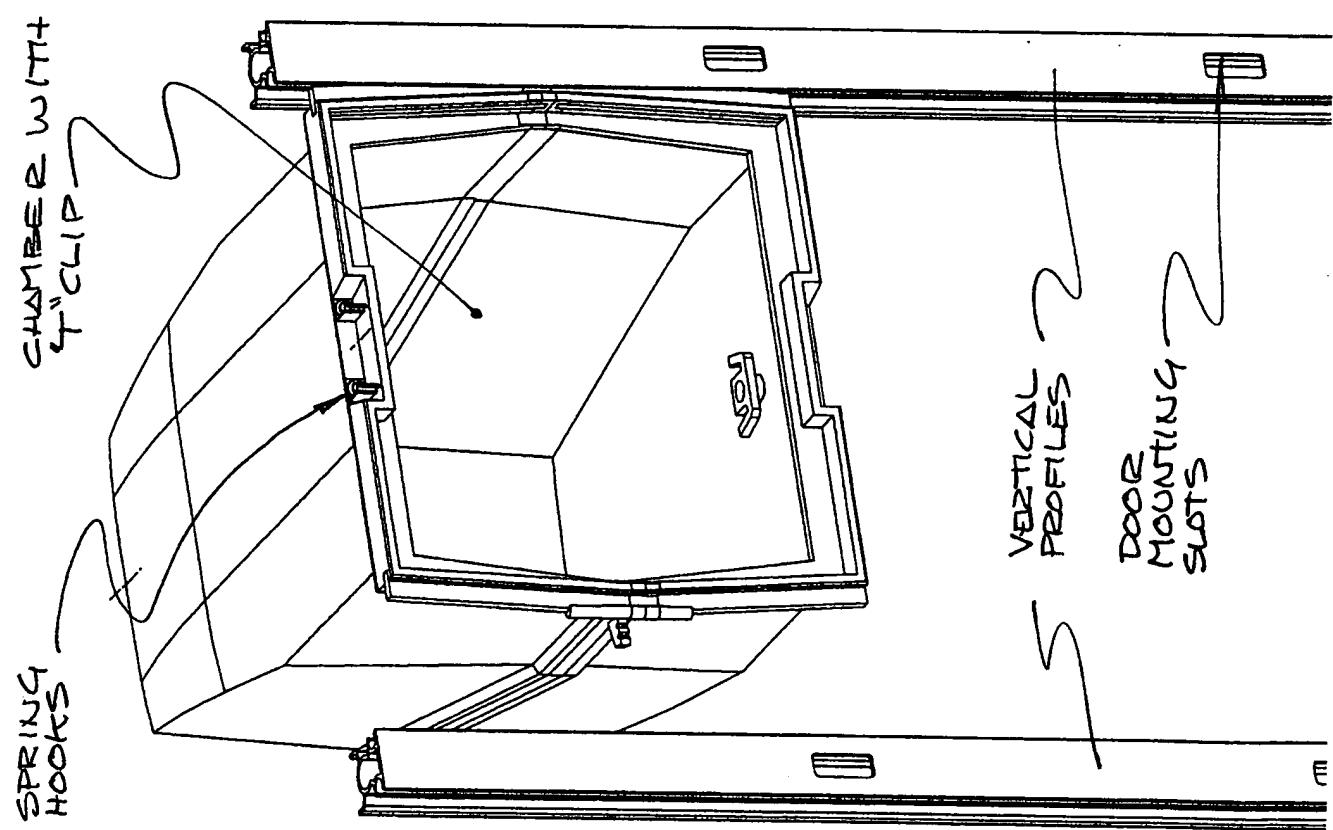
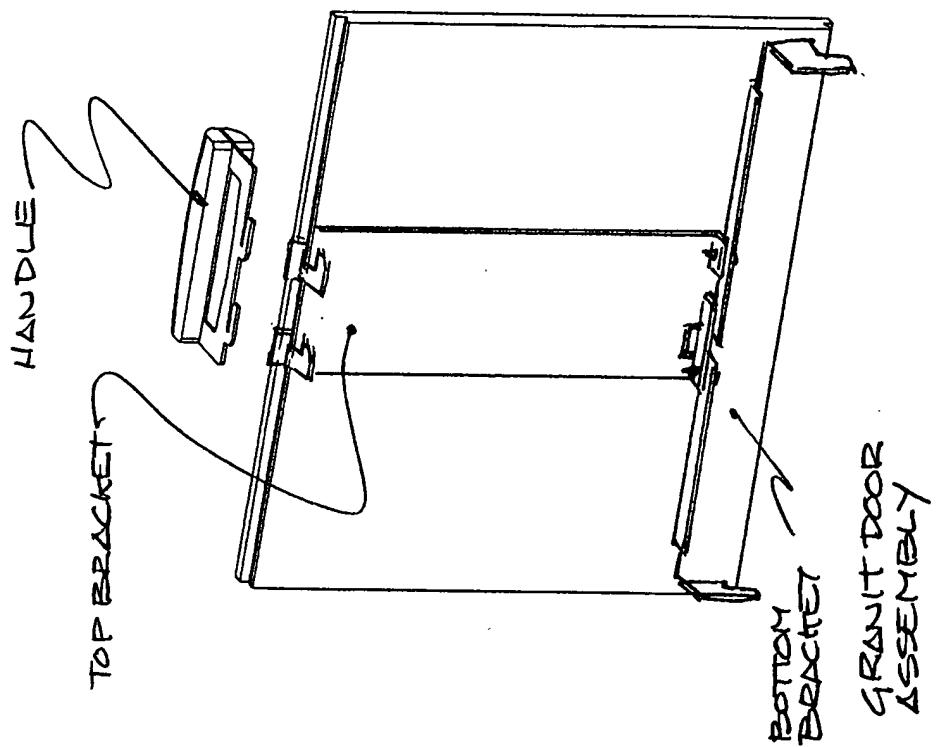
The bottom inner surface of the box is provided with a geometry that can accept a smaller part that is used as a locking mechanism, without limiting access to the niche for any other type of urn. This part has a "T" shape. From each arm of the "T", another arm is protruding downward, in a manner generally parallel to the body of the "T". These two arms are flexible and are used as snaps. There is a thickness added on the underside of the "T" to lift the arms from the bottom surface of the box once everything is assembled. The "T" is mounted flat on the bottom of the box and has a locking geometry that prevents it from rotating. A piece of hardware like a screw or rivet secures the «T» in place.

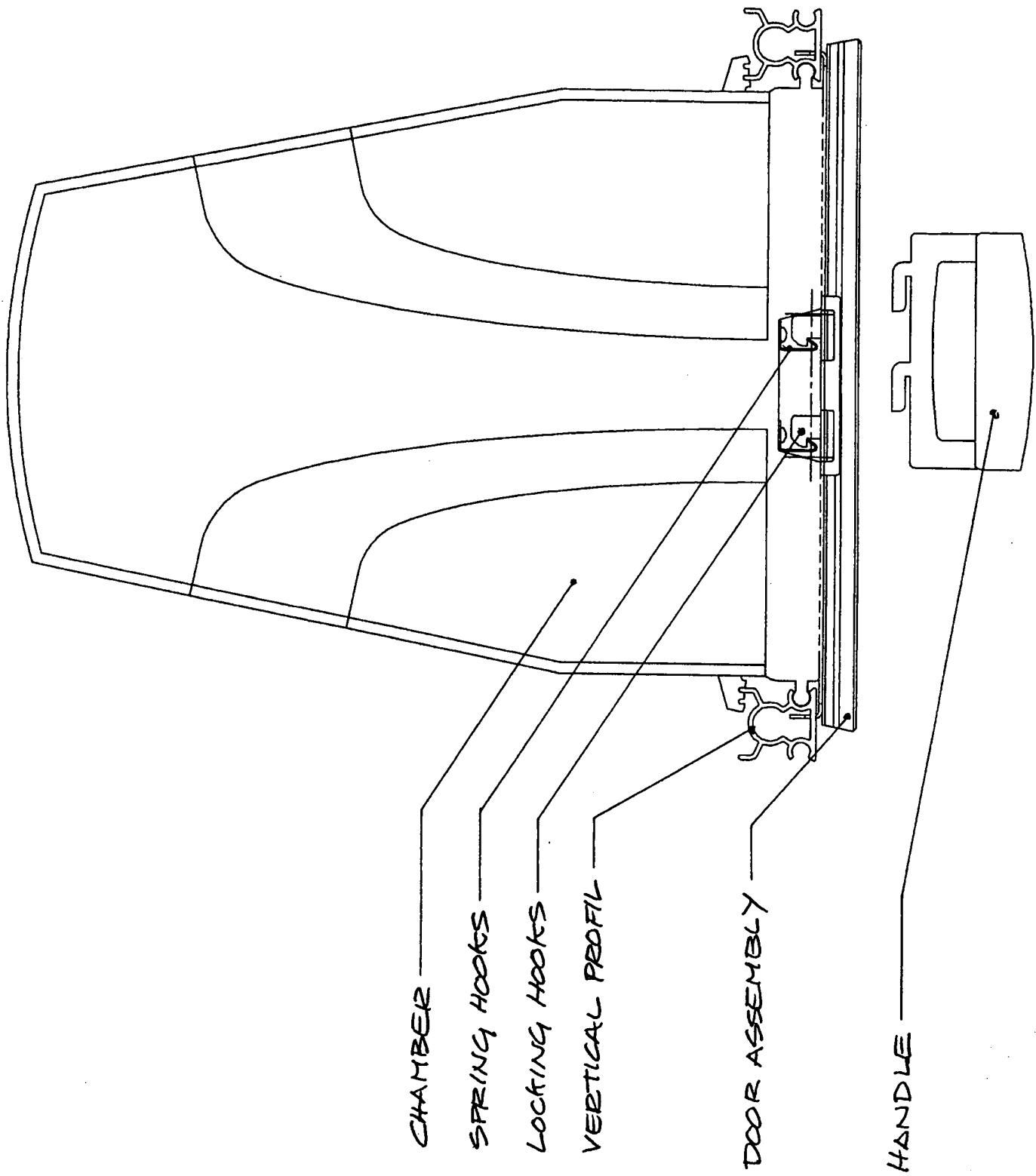
A plate, that has an opening, closes the underside of the urn. This opening has a shape that allows for the insertion of the "T" through it and a narrower section that is compatible with the width of the overthickness under the "T". When slid forward the assembly of the urn is securing the "T" and prevents it from being removed through the bigger part of the opening since the "T" is now situated over the narrower part of the opening. A smaller box is mounted inside the urn, on the plate and over this opening. This box has a depth that clears the thickness of the main part of the "T". On each lateral wall of this box is provided a vertical rib like shape over which the arms of the "T" snap when the urn is moved forward.

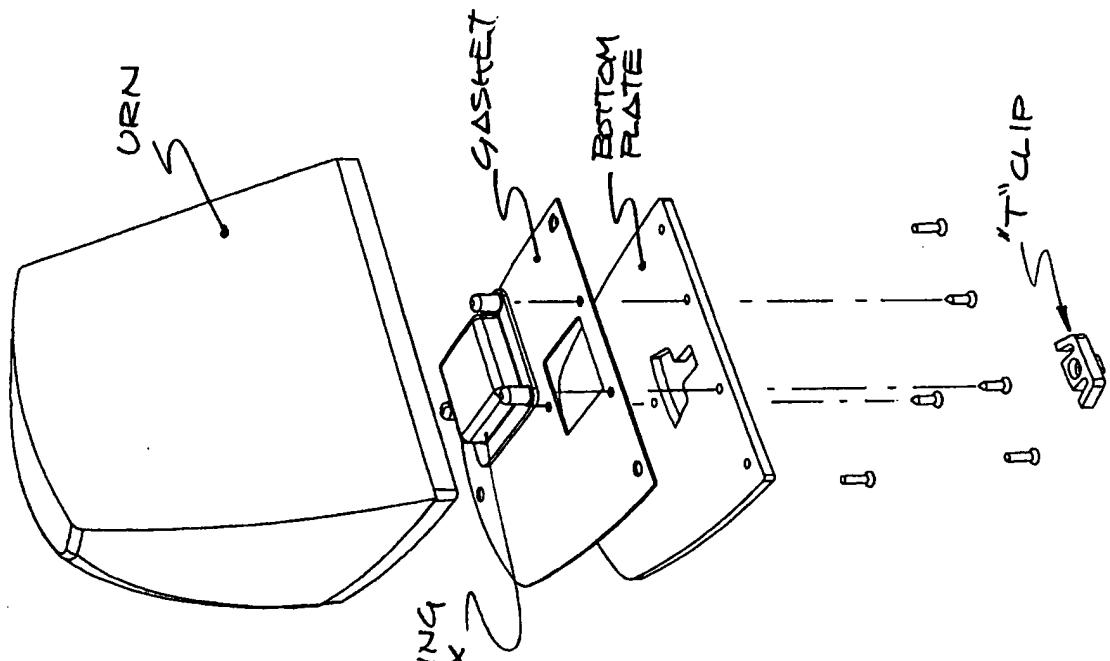
There are two variations of this assembly where one creates a permanent assembly between the urn and the box and the other allows for the removal of the urn. This is made possible by varying the radius present at the tip of the arms of the "T". If there is a big radius, pushing the urn backward, the ribs of the box inside the urn will force a pressure on the arms and make them flex. This movement will allow the urn to move all the way back where the "T" is aligned with the wider portion of the opening in the bottom plate of the urn. When there is no radius on the tip of the arms of the "T", pushing the urn backward can not transfer a release pressure to these arms since there are big surfaces of contact between the tip of the arms and the ribs inside the urn.

Another variation is the possibility of installing one or two urns in the same niche. When only one urn is installed, the "T" is mounted in a position that places the mounted urn in the centre of the floor of the box. When two urns are installed, only the front one is secured with a "T" system. The rear urn can not be removed because of the first one that is blocking the way. In that case, the "T" that locks the front urns is installed at a different position in the box so as to orient that urn sideways to give enough room for the second one.



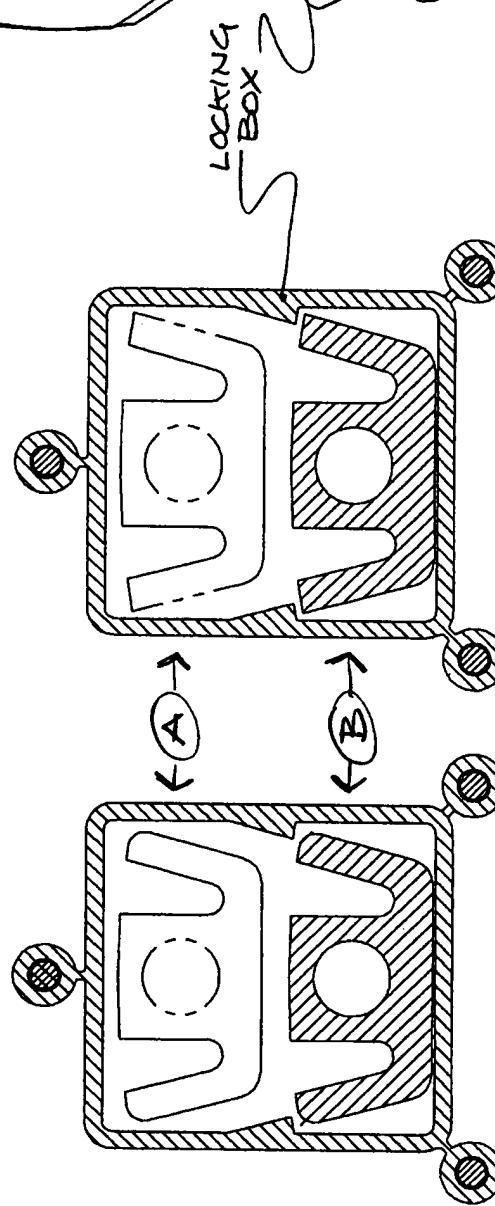






(A) POSITION WHEN
'T' CLIP GOES THROUGH
THE PLATE

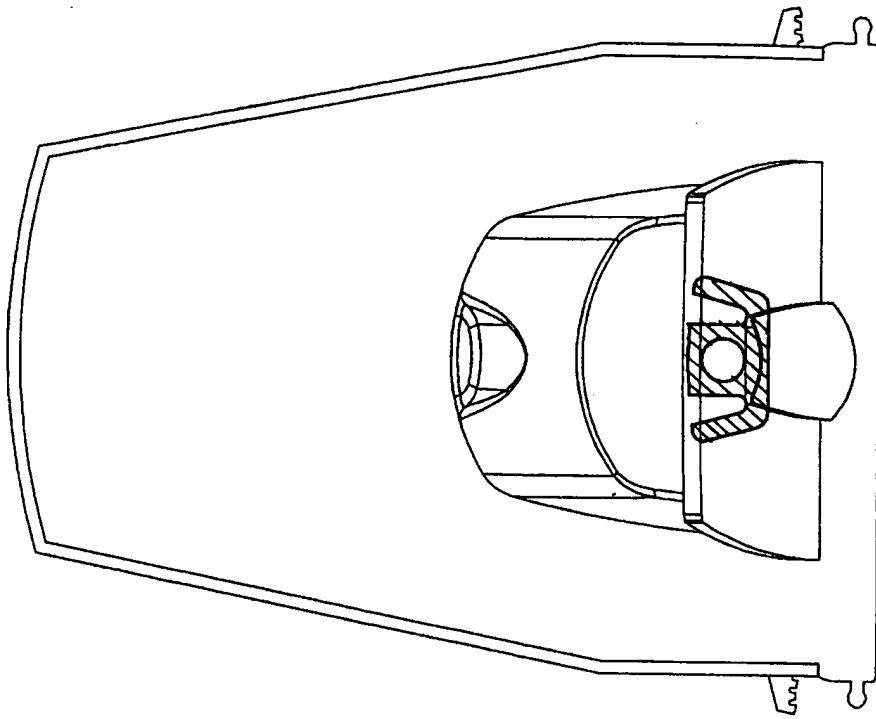
(B) LOCKED POSITION



'T' WITH RADII
THAT ALLOW
REMOVAL OF
THE URN

'T' THAT CREATES
A PERMANENT
LOCK

INSTALLATION OF
ONE URN



INSTALLATION OF
TWO URNS

